REMARKS

Claims 2-10, 12-13, 15-23, 25-26, 29-31, 33-34, 37-39, and 45-47 are pending, with claims 12, 22, 29, and 37 being independent. Claims 1, 11, 14, 24, 27, 28, 32, 35, 36, 40-44, and 48-49 were previously canceled without prejudice. Claim 16 has been amended. No new matter has been added. Reconsideration and allowance of the above-referenced application are respectfully requested.

Claim Rejections under 35 U.S.C. § 112:

Claims 2-10, 12-13, 15-23, 25-26, 29-31, 33-34, 37-39, and 45-47 stand rejected under 35 U.S.C. §112 as allegedly failing to comply with the enablement requirement. This contention is respectfully traversed.

With respect to the term "height field", this term would be clearly understood by those of ordinary skill in the art, and the present disclosure is enabling, even without a description of how the height of a surface is computed at each point. Such computations are known in the field.

With respect to the language "a viewpoint separate from viewpoints associated with the multi[ple] image sensors", those of ordinary skill in the art would clearly understand from the

disclosure that such a viewpoint is located at a position in a modeled 3D environment that is different than the positions of the image sensors (e.g., cameras) used to obtain the imagery overlaid on the 3D model. *See e.g.*, paragraphs 60, 61, 73, and 80-83 of the present disclosure.

With respect to the language "a temporal pixel average of five recent image frames", the meaning of this language is plain on its face to those of ordinary skill in the art. Moreover, a specific example of how a temporal pixel average is described in paragraph 94 of the present disclosure. The Office's reference to a "Stencil" is not understood.

For all of the above reasons, withdrawal of the rejections under 35 U.S.C. § 112 is respectfully requested.

Claim Objections:

Claim 16 is objected to for depending from itself. This objection has been obviated by the amendment of claim 16.

Claim Rejections under 35 U.S.C. § 103:

Claims 2-10, 12-13, 15-23, 25-26, 29-31, 33-34, 37-39, and 45-47 stand rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Frederick Weinhaus and Venkat Devarajan with title of "Texture Mapping 3D Models of Real-World Scenes," AMC

Vol. 29, No.4 1997 pp. 325-363, ("Frederick"), and further in view of Moura et al., U.S. 676,488B1 ("Moura").

Independent claim 12 recites (among other features), "generating a three dimensional model of an environment from range sensor information representing a height field for the environment" (emphasis added). The Office asserts that Moura teaches this subject matter. However, Moura is explicitly directed to generating a three-dimensional model of an object from a two-dimensional image sequence. *See* Moura at col. 2, lines 25-36. This cannot be construed as generating a three dimensional model of an environment from range sensor information representing a height field for the environment.

In fact, Moura explicitly teaches that his techniques for generating a three-dimensional model of an object are directed to handling the case where no prior knowledge about the scene (or object shape) is available. *See* Moura at col. 1, lines 43-47, and col. 11, lines 49-52. Thus Moura actually teaches away from the proposed combination.

In view of the above, independent claim 12 should be allowable over the cited art. Independent claim 22 recites (among other features), "a model construction component that generates a three dimensional model of an environment from range sensor information representing a height field for the

environment" (emphasis added). Thus, independent claim 22 should be allowable over the cited art for at least reasons similar to those addressed above. Dependent claims 2-10, 13, 15-23, 25-26, and 45-47 should be allowable based on the above arguments and the additional recitations they contain.

With respect to independent claims 29 and 37, the Office merely states, "See rejection of claim 12[.]" *See* OA mailed 06/21/2006 at pp. 9 and 10. Attention is called to the fact that independent claims 29 and 37 recite different features than claim 12, and the claimed features of independent claims 29 and 37 have not been addressed by the Office.

Thus, in addition to the reasons addressed above regarding the lack of motivation to combine Moura with Frederick as suggested by the Office, a prima facie case of obviousness has not been established because the Office has not explained how the cited art can fairly be viewed as teaching:

> obtaining a three dimensional model of an environment; identifying in real time a region in motion with respect to a background image in real-time video imagery information from at least one image sensor having associated position and orientation information with respect to the three dimensional model, the background image comprising a single distribution background dynamically modeled from a time average of the real-time video imagery information; placing a

> surface that corresponds to the moving region in the three dimensional model; projecting the real-time video imagery information onto the three dimensional model, including the surface, based on the position and orientation information; and visualizing the three dimensional model with the projected real-time video imagery; wherein identifying a region in motion in real time comprises subtracting the background image from the real-time video imagery information, identifying a foreground object in the subtracted real-time video imagery information, validating the foreground object by correlation matching between identified objects in neighboring image frames, and outputting the validated foreground object; wherein identifying a foreground object comprises identifying the foreground object in the subtracted real-time video imagery information using a histogram-based threshold and a noise filter; wherein identifying a region in motion in real time further comprises estimating the background image by modeling the background image as a temporal pixel average of five recent image frames in the real-time video imagery information.

(emphasis added), as recited in independent claim 29. Likewise, the Office has not explained how the cited art can fairly be viewed as teaching:

> an object detection and tracking component that identifies in real time a region in motion with respect to a background image in real-time video

imagery information from at least one image sensor having associated position and orientation information with respect to a three dimensional model, the background image comprising a single distribution background dynamically modeled from a time average of the real-time video imagery information, and places a surface that corresponds to the moving region with respect to the three dimensional model; a dynamic fusion imagery projection component that projects the real-time video imagery information onto the three dimensional model, including the surface, based on the position and orientation information; and a visualization sub-system that visualizes the three dimensional model with the projected real-time video imagery; wherein the object detection and tracking component identifies the moving region by performing operations comprising subtracting the background image from the real-time video imagery information, identifying a foreground object in the subtracted real-time video imagery information, validating the foreground object by correlation matching between identified objects in neighboring image frames, and outputting the validated foreground object; wherein identifying a foreground object comprises identifying the foreground object in the subtracted real-time video imagery information using a histogram-based threshold and a noise filter; and wherein identifying a region in motion in real time further comprises estimating the background image by modeling the background image as a temporal pixel average of five

recent image frames in the real-time video imagery information.

(emphasis added), as recited in independent claim 37. Furthermore, attention is called to the fact that a claim rejection violates 35 U.S.C. § 132 if it "is so uninformative that it prevents the applicant from recognizing and seeking to counter the grounds for rejection." *See Chester v. Miller*, 906 F.2d 1574, 1578 (Fed. Cir. 1990). This is the case with the present Office Action.

In view of the above, independent claims 29 and 37 should be allowable over the cited art. Dependent 30, 31, 33, 34, 38, and 39 should be allowable based on the above arguments and the additional recitations they contain.

Conclusion

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific issue or comment does not signify agreement with or concession of that issue or comment. Because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as

specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

It is respectfully suggested for all of these reasons, that the current rejections are overcome, that none of the cited art teaches or suggests the features which are claimed, and therefore that all of these claims should be in condition for allowance. A formal notice of allowance is thus respectfully requested.

Please apply the three month extension of time fee, and any other necessary charges or credits, to Deposit Account No. 06-1050.

Respectfully submitted,

Date: Dec. 21, 2006

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